

WHAT IS CLAIMED IS:

1. A separation apparatus, including:
 - a substrate;
 - a channel provided in said substrate and for flowing sample
in said channel;
 - 5 a separating portion provided in said channel and for
separating a specific substance in said sample; and
 - a fine channel provided in said separating portion and having
a width that is smaller than that of said channel,
 - wherein a layer of an adsorptive substance is formed in said
10 separating portion, said adsorptive substance selectively adsorbing
or binding to said specific substance.
2. A separation apparatus, including:
 - a substrate;
 - a channel provided in said substrate and for flowing sample
in said channel;
 - 5 a separating portion provided in said channel and for
separating a specific substance in said sample; and
 - a protruding portion provided in said separating portion,
wherein a layer of an adsorptive substance is formed in said
separating portion, said adsorptive substance selectively adsorbing
10 or binding to said specific substance.
3. The separation apparatus according to claim 1 or 2, wherein
electrodes are provided in said separating portion and said channel,

and said separation apparatus further comprises an electrical voltage applying unit that provides electrical voltage between said electrodes.

4. The separation apparatus according to any one of claims 1 to 3, wherein a protruding portion is provided in said separating portion, and an electrode is formed in said protruding portion.

5. The separation apparatus according to any one of claims 1 to 4, wherein a combination of said specific substance and said adsorptive substance is any one of: an antigen and an antibody; an enzyme and a substrate; an enzyme and a substrate derivative; an enzyme and an inhibitor; a sugar and a lectin; a DNA and a DNA; a DNA and an RNA; a protein and a nucleic acid; a metal and a protein and a ligand and a receptor.

6. The separation apparatus according to any one of claims 1 to 5, wherein said adsorptive substance is provided through a spacer on the surface of said substrate.

7. A separation method, comprising:

in a separating portion of a separation apparatus including a channel provided in a substrate, a separating portion provided in said channel and a fine channel provided in said separating portion and having a width that is smaller than that of said channel,

introducing a liquid containing an adsorptive substance into said channel while applying an electrical voltage of different

polarity than that of said adsorptive substance to said separating portion to cause an adsorption onto said separating portion, said
10 adsorptive substance being capable of selectively adsorbing or binding to a separating target substance;

introducing a sample containing said separating target substance into said channel to cause a selective adsorption or binding to said adsorptive substance; and

15 introducing an eluting solution into said channel to elute and recover said separating target substance, said eluting solution being capable of causing an elution of said separating target substance from said adsorptive substance.

8. A separation method, comprising:

in a separating portion of a separation apparatus including a channel provided in a substrate, a separating portion provided in said channel and a protruding portion provided in said separating
5 portion, introducing a liquid containing an adsorptive substance into said channel while applying an electrical voltage of different polarity than that of said adsorptive substance to said separating portion of said separating apparatus to cause an adsorption onto said separating portion, said adsorptive substance being capable of
10 selectively adsorbing or binding to a separating target substance;

introducing a sample containing said separating target substance into said channel to cause a selective adsorption or binding to said adsorptive substance; and

introducing an eluting solution into said channel to elute
15 and recover said separating target substance, said eluting solution

being capable of causing an elution of said separating target substance from said adsorptive substance.

9. A mass spectrometry system, comprising:

a separating unit that separates a biological sample according to molecular size or a property of the biological sample;

5 a pretreatment unit that conducts a pretreatment including an enzymatic digestion treatment of the sample separated by said separating unit;

a drying unit that dries the pretreated sample; and

a mass spectrometry unit that achieves a mass spectrometry of the sample after drying,

10 wherein said separating unit contains the separation apparatus according to any one of claim 1 to claim 6.